

Flute Extended Techniques

My search, is about the contemporary playing techniques for the flute. For this reason, I am going to present not the common, but the extended playing techniques for the flute, accompanied with new music notation and giving a complete description with instructions to handle them. Furthermore, I am creating a guide for those composers who are interested in using the flute in a different way than the common one. This book includes not only definitions and instructions of the modern effects between 20th and 21st century, but also examples of notation for each technique. I am presenting effects that change the tone color of the flute, effects that change the vibration of the air stream, techniques that present the flute as a percussive instrument and others that include the voice of the flutist. The last pages complete my book with information about instructions and notation that should accompany the scores when it comes to electronic parts.



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Eirini Mavrogiannaki

Flute Extended Techniques

A Guide for Composers

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ABSTRACT

Flute Extended Techniques: A Guide for Composers

Many composers have considered the flute as their favorite instrument. Its tone is deemed by many composers as poetic not only for its soft tone in the low and middle area, but also for its brightness in the high area. The combination of its beautiful sound and the variety of many, different playing techniques give composers the opportunity to experiment more with this instrument in search for special sounds, speaking and playing or singing and playing.

My search, is about the contemporary playing techniques for the flute. For this reason, I am going to present not the common, but the extended playing techniques for the flute, accompanied with new music notation and giving a complete description with instructions to handle them. Furthermore, I am creating a guide for those composers who are interested in using the flute in a different way than the common one. This thesis includes not only definitions and instructions of the modern effects between 20th and 21st century, but also examples of notation for each technique. I am presenting effects that change the tone color of the flute, effects that change the vibration of the air stream, techniques that present the flute as a percussive instrument and others that include the voice of the flutist. The last pages complete my thesis with information about instructions and notation that should accompany the scores when it comes to electronic parts.

DEDICATION

I dedicate this paper to my mother, Vaso Frantzeskou, who always believed in herself and realized her dreams to become a doctor. Now, she believes in me to realize mine. Thank you mother for supporting wholeheartedly my master studies in Anton Bruckner Private University and you were always next to me as a doctor, as an audience, as a woman, as a friend, as a mother...

Life plays strange games with you. Sometimes pleasant, sometimes unpleasant and sometimes it combines both of these feelings at the same time. I still remember that night when I received the call to participate in the Thessaloniki's Concert Hall as a composer, where that night I was mourning the loss of my grandfather. I asked him to take away my pain. I considered it as a gift from him, so I dedicated the whole work to his memory, based on his profession, the profession of a "tailor". After two years, I suddenly received a message of interest from *OmniScriptum Publishing House* to publish my thesis in a book. It wasn't until I was 29 that most of my dreams came true, always with God's help. Because you don't become a happy person because of money, but because you have managed to do in your life everything you wanted. And I wonder, how do the events of human life come together? Certainly the combinations in a composition for orchestra are not random. So I continue to wonder, how well does our own Composer take care of us to combine a pleasant event upon an unpleasant one in our life? How well can we understand His Sinfonia? His Work always continues *da capo*. Life plays strange games with you... until it reaches *al fine*.

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INTRODUCTION

“The first thing you see on looking into a deep well is your own face and this is at least disconcerting. Longer looking reveals what is further in the well. Even there are vexed to discover another face which is also yours. Even while you are bearing your idea for your next composition, the past may come up, total recall without pretense, and not always pretty. You need to adjust to the fact that there will be more of this in the future – bad critics, not well-performed concerts etc. If you want to leave, is understandable, but is still a matter of regret, because you are just on the point of getting to know yourself.”¹ The wise composers, instead, would smile quietly, develop their creativity idea while thinking all the music on its all.²

It often takes time to create a good work. However, the deadlines that are given from the companies or the universities and the composition contests that direct your creativity make composers forget their purpose by making them limiting their freedom. I agree with Matthew Ketly who says in his book *Flute solo* that “many people may tell you to hurry on, to move on, to come on – if you surrender to guilt and agree with the voices outside, then the heart returns to its old unhappiness, the old fare, the old routine. And only for a while, just long enough to taper off the din of a world come in with you. It does not take long. Sometimes a quiet craft, or a drawing, or a painting. Sometimes a candle will help. Some darkness. It is the dark that gives point to our ears, for in the dark not yet used to, we see too much.”³

The past two centuries, some composers required performers to learn new playing techniques of producing sound with the flute. One problem that had not been entirely solved at that point was how to notate many of those new techniques. Some techniques had been required of all performers, including tapping on the instrument or on some other surface, whistling, and a wide variety of vocal sounds. In these cases, the performer had the role of a percussionist, whistler, or vocalist, instead of a flutist.⁴

Allow me to believe, that the creation of new music is often “computational”. Music is not so simple anymore. We believe that our purpose today, is to experiment with technology and compose something brand new, that wasn’t heard before, aiming to become at last pioneers. We forget that this is not the case, is not a purpose to compose something new. For me, composition is my voice to communicate with the audience and express ideas that plague today’s society. Who is able to understand, understands.

According to the flutist Eftihia Victoria Arkoudis “the classical and avant-garde aesthetics blended with emerging Jazz idioms, the songwriting business of Tin Pan Alley, and the music of Broadway and movies, bringing forth a bustling commercial industry”.⁵ She continues saying, that “the concurrence and merging of so many

¹ Matthew Ketly, *Flute Solo*, Kansas, 1979, p. 5.

² Ibid.

³ Ibid., p. 3.

⁴ Ibid., p. 222.

⁵ Eftihia Victoria Arkoudis, “Contemporary music Notation for the Flute: A Unified Guide to Notational Symbols for Composers and Performers”, Ph.D. diss., West Virginia University, 2019, p. 1.

different musical styles gave rise to new genres of music across art and popular musical traditions, later often in combination with the construction of electronic and computer music instruments, which inspired composers of the mid- and late-twentieth century to reimagine their compositional methods and make music that is both relatable and thought-provoking.”⁶

My Thesis aims to present the extended flute techniques with music notation and symbols indications, creating a guide for composers who wish to explore the contemporary flute notation and broaden their horizons to the sound of modern music, with the unique aim to explore some new colors in modern flute repertoire and hopping to add them eventually in their compositional palette for their future compositions. For this reason, there will be mention to special techniques. A special technique may use a different-shaped note head to distinguish it from ordinarily played notes, as long as the notation has verbal qualification. Unconventional techniques can be described with conventional notation and verbal explanation.⁷

This paper includes some unconventional techniques used commonly from composers between 20th and 21st century. The first chapter deals with the historical context regarding to the new compositional techniques of the mid-twentieth century with its notational experiment and innovation. For this reason, I am referring mainly to composers who used or even invented different notation for new methods of composing. Erhard Karkoschka's *Notation in New Music* (London: Universal edition, 1972) catalogued many of these strands, which showed a lack of a common language. Kurt Stone's *Music Notation in the 20th century: A Practical Guidebook* (W. W. Norton, 1980) standardizes the 20th century new notation symbols. Some of Stone's proposals have been adopted widely, while others have not been found so useful.⁸ In this thesis, I am presenting the music notation that I believe, according to my experience as a composer and collaboration with other flutists, is more practical and memorable.

The second chapter is considered as the main part of my thesis. Here, I categorize the techniques in a detailed hierarchy of headings that aims to help the reader navigate these pages and find information quickly. Each topic is structured according to definition and use from the elementary to the complex. Definitions are given where terminology is deemed confusing. Of course, a basic knowledge of music theory is assumed. In overall, I have been pretty selective in the choice of extended flute techniques including in this thesis, and this should give the composer the facility to create notation for some of the most uncommon techniques. A familiar technique can be read and understood quickly and without doubt there are already so many different ways of notating the same thing. An unfamiliar notation takes much longer for the reader to understand it. I totally agree with the author Elaine Gould, who says that “the

⁶ Ibid.

⁷ Elaine Gould, *Behind the Bars: The definite guide to Music Notation*, London: Faber Music, 2011, p. 248.

⁸ Stefan Kostka, *Materials and Techniques of Twentieth-Century Music*, 3d Ed., New Jersey: Pearson Prentice Hall, 2006, p. 175.

more complicated the notation is, the greater the possibility is to create a barrier to the reader".⁹

The modern composer knows very well that a composition does not only apply in theoretical aspect, but also in practical. So, when it comes to the practical situation, a composer interacts also with other people in charge, such as technicians, sound engineers etc. Here, the reader is informed about the basic notational requirement as a performance tool, especially when it comes to electronic sounds. The function of notating electroacoustic sounds (pre-recorded or processed live) is to describe them with as many points of reference as are necessary to co-ordinate performers and electronic component, giving all necessary information to the technician. This kind of information, I believe, is of highly importance because a composition is complete when it comes to the performance. Of course, the knowledge included in this chapter, can also be applied to other instruments as well, since this chapter provides information about the coordination between performers and other people involved in a performance either in a studio or in recording.

I am going to explain these techniques through specific examples that witness also the music notation. Unless otherwise stated, the examples are mine. A composer can be fully informed not only about the extended techniques and the sound they produce, but also how to notate a specific technique on the score, giving specific instructions to the flutist in order to achieve the willing outcome. Finally, I am going to compare each technique with each instrument of the flute family.

My views, in overall, are based on the last eight years of my studies in Greece and Austria, my experience as a composer, my participation in seminars, festivals and collaboration with other composers and performers. It is my aim to present the extended flute techniques with the contemporary flute notation, creating a user-friendly guide for composers who are interested in adding and expanding those new sounds in flute repertoire.

⁹ Gould, p. xiii.

CHAPTER ONE

The Background of Contemporary Notation for the Flute

The influence of difference was first demonstrated by Tartini, who also showed that two notes of equal power and timbre result in a third note that is lower than the other two.¹⁰ This way of analyzing acoustical facts led to the discovery of chords on the flute. Claudio Sebastiani stated: “when playing some part on a wind instrument, one must sing simultaneously the bass, the tenor or another voice in a soft murmuring manner that is easy to learn”.¹¹ On the other hand, Georg Bayr has refined his technique for playing double notes on the flute to the point that it works with all scales and allows every flutist to simultaneously play audible thirds, fourths, fifths, and sixths. In order to understand Bayr’s chords, one must use a 13-key flute. The air column’s unsteady equilibrium between notes with similar fingering or between various overtones of the same fundamental gives rise to the chords. The exercise is difficult, but the result is surprising. Despite the fact that composers rejected and thought these unusual notes were useless, they are now commonly used because of their unique character.¹²

Some flute effects are adapted from modern string compositions. These techniques, such as the use of harmonics, multiple stops, quartertones, or glissandi, are undoubtedly not inventions of the 20th or 21st centuries, but they are utilized far more frequently in contemporary scores.¹³ Berlioz stated that “it would be curious to try once, in a composition written for the occasion, the simultaneous use of all the musical forces that can be gathered together. Let us suppose that the conductor had them at his command, in a vast hall designed for the purpose by an architect familiar with acoustics and music.”¹⁴ Additionally, *Treatise on Instrumentation*, which he wrote in 1844, contains symbols that emphasize the power of orchestral instruments. In final chapter of his work *Treatise*, the composer describes a large orchestra counting up to 830 musicians. This demonstrates that Berlioz was considering a novel strategy for the music and composition arts as well as for the audience to perceive a different notion and strategy.¹⁵

The absence of certain timbres throughout the action allowed Wagner, on the other hand, to use a smaller ensemble of instruments to effectively portray an emotional state. This eliminated the notion of a tonal core employing chromaticism, distant modulations, and dissonances. A new realm of possibilities consequently emerged, undoubtedly inspiring other composers, such as Bruckner, Strauss, Scriabin, and early Debussy. But a crucial aspect of Wagner’s idea is the continual alternation of the instruments used, leading to a certain use of color that survived as an orchestral

¹⁰ Raymond, p.128.

¹¹ Ibid., p. 129.

¹² Kostka, p. 56.

¹³ Ibid., p. 225.

¹⁴ Pierre Boulez and Jean Jacques Nattiez, *Orientations*, Cambridge: Harvard University Press, 1986, p. 213-214.

¹⁵ Ibid.

technique in the twentieth century.¹⁶ Of course, Wagner did not inspire all the composers. Some of them were Tchaikovsky, Smetana, Dvorak, Leoš Janáček and Maurice Ravel, who preferred to use their traditional musical elements of their Russian and Czech heritage. Ravel preferred to base his music on the exotic and oriental elements found in Spanish, Greek, Italian and Hebrew folk music.¹⁷

The composers previously mentioned have one thing in common: they looked for alternative ways to fulfill their goals and aesthetic vision rather than reiterating the “older” techniques. In other words, through the unconventional pairing of instruments and the emergence of those new playing skills, they introduced contemporary effects and instruments to their works in order to transform the art of instrumentation into a useful tool, which is also of interest of this thesis. Because they are considered to be “extensions” of the well-known, common techniques, which result from a non-traditional playing style, the current playing techniques are also known as expanded techniques. An example for the flute could be the *flutter-tonging* effect. The flutist is asked to roll the tip of the tongue on the alveolar ridge by using the consonant [r], resulting to a tremolo effect. In this way, the flutist abandons the traditional articulation which requires the consonants [t] and [d].¹⁸

Pyotr Ilyich Tchaikovsky (1840-1893) was one of the first composers who used extended techniques for the flute. Let us have in mind, that one of the first extended techniques was the *flutter-tonguing* effect. Tchaikovsky inserted this technique in the second act of his ballet *The Nutcracker* in 1892 and also notated this technique as “frullato”, repeating it throughout the movement as “sempre frullato”. However, Richard Strauss (1864-1949) was the composer who first introduced this technique with his poem *Don Quixote* for cello, viola and orchestra in 1897.¹⁹

Claude Debussy (1862-1918) was the next composer, who established the flute as a solo instrument. He took advantage of the ethereal sound of the flute, creating melodies with dynamic variety. His use of bitonality, pentatonic and whole-tone scales transformed the flute’s character in the eyes of future composers and sparked new musical ideas.²⁰ These transformations continued with the leader of the Second Viennese School, Arnold Schoenberg (1874-1951) and his innovative twelve-tone system. Schoenberg’s dodecaphony accepted all twelve pitches of the chromatic scale as significant and treated them equally. Even though the concept of microtonality has its roots in ancient Greece, it became an integral part of contemporary music. By adding intervals smaller than a semitone on the harmonic palette, the number of pitches composers could use increased. As a result, came the need for a new notational system able to depict these quarter-tones and microtones. Nevertheless, a standardized notation

¹⁶ Heinz Hans Stuckenschmidt, *Twentieth Century Music*, Richard Deveson (trans.), New York: McGraw-Hill, 1969, p. 28.

¹⁷ *Ibid.*, p. 29.

¹⁸ Arkoudis, p. 10.

¹⁹ *Ibid.*, p. 11.

²⁰ *Ibid.*, p. 12.

for all quarter-tones and microtones remains yet, decades later, a non-standardized technique, as composers prefer to choose their own personalized language.²¹

The flute's extensive registral, dynamic contrast, and articulation range were made possible by Schoenberg's use of the instrument's qualities. He successfully used the flute both in a traditional and progressive way with the theatrical *Sprechstimm* technique in his *Pierrot Lunaire* (1912). At the same time, Italian futurist Luigi Russolo started experimenting with different techniques to turn the sounds of contemporary industry into music. In his book *The Art of Noises* (1913) he presents six groups of noises, such as roars, thunderings, whistling, hissing, muttering, gurgling, screeching, rubbing, shouts, screams and noises by beating on metals, skins, woods.²² Conversely, Edgar Varèse wanted his pieces to sound unlike anything that had ever been heard.²³ He had long argued in favor of the development of new instruments capable of producing previously unheard tones, and his 1936 composition *Density 21.5* for unaccompanied flute offered him the opportunity to show his proficiency with the instrument.²⁴ In his work, Varèse gave the flute an industrial and metallic quality. He used the flute's full dynamic range and dynamic range along with intricate rhythmic themes, and he added the first percussion effect a flutist had ever had to display –*key clicks* (added in 1946). The introduction of key clicks by Varèse, which call for the flutist to aggressively press the flute's keys in order to produce a pitch resonance, marked the start of a new age for the contemporary flute, which would take off in the 1950s. Following Varèse's seminal work *Density 21.5*, there was a considerable increase in the number of composers and performers who sought to specialize in and include innovative performance approaches in their compositions for the flute.²⁵

The effect of simultaneously *singing and playing* was the next famous technique that was used around 1950's. This technique was used by the rock band Jethro Tull and by jazz bands, such as *Sam Most Quintet*.²⁶ Joyce Mekeel (1931-1997) was a composer and flutist, who incorporated this technique in his work *The Shape of Silence*. In this work, the flutist is asked to speak specific words across the embouchure hole sustaining low register notes.²⁷

Among other composers, Luciano Berio (1925-2003) added the earliest notated multiphonic for the flute, a perfect fourth G-C interval, in his *Sequenza I per flauto solo* (1958). In *Sequenza I*, Berio also incorporates flutter tonguing, extreme register leaps, and stark articulation.²⁸ Burt Levy (1936-2010), however, preferred to use a conglomeration of percussive effects, timbral tremolos, harmonics, glissandi, and multiphonics in his work *Orbs with Flute*.²⁹ Other composers, such as Kazuo

²¹ Read Gardner, *20th-Century Microtonal Notation*, New York: Greenwood Press, 1990, p. 3.

²² Luigi Russolo, *The Art of Noises*, New York: Pendragon Press, 1986, p. 28.

²³ Nancy Toff, *The Flute Book A Complete Guide for students and performers*, 3d Ed., New York: Scribner's Sons, 2016, p. 140.

²⁴ *Ibid.*, p. 141.

²⁵ *Ibid.*

²⁶ Arkoudis, p. 17.

²⁷ *Ibid.*, p. 19.

²⁸ *Ibid.*, p. 20.

²⁹ *Ibid.*, p. 21.

Fukushima (1930-), preferred to incorporate characteristics of their traditional music.

Fukushima, for example, used techniques like bending technique, glissando and overblowing in order to bring in the mind the traditional Japanese bamboo flute.³⁰ Nevertheless, many flutists were asked to use different flutes of the flute family. Karlheinz Stockhausen (1928-2007), for instance, asked from the flutist to bridge the changes of instruments with sung or hummed notes, kissing noises, keyclicks or tongue clicks, while alternating with whistling, varied vibrato, timbral trills and quarter notes.³¹

The flute music of the avant-garde has utilized chords, microtones, noises made by the keys, tongue clicking, and other sounds. These special effects have been around for a while, but conventional methods rejected them as being accurate. Today, there is a different approach that includes these sounds in performances. Some playing techniques used in contemporary score are not entirely new but represent an intensification or development of earlier usages. The technique of playing polyphonically is also old. Wind players have for a long time tried to sing and blow simultaneously, a practice which must have been fairly widespread in folk music.³²

In conclusion, there are plenty symbols in flute repertoire. Future musicians will require an effective modern notation system that will enable them to comprehend contemporary sounds. For this reason, composers, flutists or musicologists become writers in order to collect those symbols and try to describe the sound or even teach the way of the execution categorizing them according to the timbre, voice, breath or any other category may help the musician understand more.

³⁰ Ibid., p. 22.

³¹ Ibid., p. 22.

³² Kurt Stone, *Music Notation in the Twentieth Century*, 1st Ed., New York: Norton, 1980, p. xvi.

CHAPTER TWO

Extended Techniques

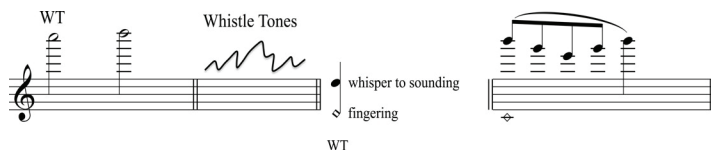
1. Tone Color & Special Effects

1.1. Whistle Tones

Whistle Tones are known also as Whisper Tones and sound like whistling. These are high, pure sine tones when seen as separate partials of notes. The flutist can create this sound utilizing fingerings in the first and third registers based on the harmonic series. With the fingerings of the third register combines to a gentle exhale, the air is moving with very low pressure. In addition, they can also be made in the flute by completely covering the embouchure hole with the lips as you breathe in or out. Whistle tones are notated with the full word “whistle tones” or by the initials “W.T.”.³³ William Kincaid is credited with the first official use of this technique as a teaching method.³⁴ He used whistle tones as a warm-up exercise designed for lip control and relaxation. Whistle tones are soft, high and clear individual upper partials of the fingered note. Most frequently, they involve the fifth through tenth partials, while some lower notes can produce up to the sixteenth partial, or four octaves above the fundamental (Figure 2). This allows for between five to fourteen available sounds. Whistle tones are possible on every fingering but the lower fingerings are more quick to produce the desired effect.³⁵ The actual register of the whistle tone is controlled by raising or lowering the tongue, just as if you were whistling, hence one possible source of its name.³⁶ Commonly, W.T.³⁷ is printed over the note with an * and an explanatory footnote. Some composers use the diamond shaped note with a footnote and employ the method of notating the fundamental and the desired whistle tones.³⁸

Whistle tones are quite unstable, even though notating the sounding pitches is really nice on paper. They are not easily isolated as they tend to oscillate between pitches very readily. Also, their dynamic range is limited. The tones are barely audible beyond twenty feet. Many artists have found that maintaining whistle tones is challenging and articulation is almost impossible. This technique can be used on all flutes (Picc/Alto/Bass).³⁹

Figure 1: Notation for the technique of *Whistle Tones*.⁴⁰



³³ “Flutexpansions”, <https://www.flutexpansions.com> (accessed in November 28, 2022).

³⁴ Gould, p. 97.

³⁵ Thomas Howell, *The Avant-Garde Flute*, Berkeley: University of California Press, 1980, p. 26.

³⁶ Willis Morya, *Notation and Performance of Avant-Garde Literature for the Solo Flute*, Florida: University of Florida Press, 2001, p. 52.

³⁷ W.T. stands for *Whistle Tones* and can also be written without the dots, as WT.

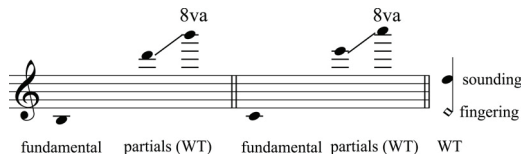
³⁸ Ibid., 53.

³⁹ Gould, p. 249.

⁴⁰ Arkoudis, p. 22.

Some works which include Whistle Tones are *Sequenza I* by Luciano Berio, *Écrit* by Heinz Holliger, *Honami* by Wil Offermans, *Monodie IV Pour une Espace Sacré* by Antoine Tisne, *Soliloquium No 1* by Jeney Zoltan.⁴¹

Figure 2: The upper partials of the fingered note produce Whistle Tones.⁴²



1.2. Multiphonics

A flute technique with complexity is Multiphonics. “They are multiple sonorities that have been used in modern flute repertoire since 1958.” According to the flutist Eftihia Arkoudis, “multiphonics can be produced by either over- or under-blowing a fingering for a single pitch, or by using special fingerings. In order to hear all sonorities, a flutist must maintain the optimal lip opening size and a focused air stream at an angle as they produce two, three, four, and up to five pitches at the same time.”⁴³ This action results in a complex pattern of vibrations in which more than one pitch is perceived simultaneously, but the pitches are unequal. As composers we need to examine carefully the fingerings with which we provide performers. The multiphonic fingerings provided in some sources do not produce the pitches displayed on the staff, for example. Therefore, it is more helpful to verbally describe the type of sound required than to prescribe a chord that may be realistically achievable or where pitches may be obscured by prevailing timbral noise.⁴⁴ For a non-specific multiphonic (or non-preferable) it is sufficient to indicate that a multiphonic should be produced, and to show the approximate pitch area required – or the outer extremes, if control of the upper range is required. Use a contrasting notehead such as crosses or diamonds: diamond notes are more legible for minims and semibreves. This technique can be used on all flutes (Picc./Alto/Bass). Some fingerings may be different between the flutes.⁴⁵ When trying to sustain a multiphonic, the aiming between notes to achieve the sonority tends to increase the effect of one tone becoming predominate. Multiphonics are at times slow to respond and tricky to execute. This often leads to unwanted starts and stops on the part of the newer flutists of this effect. So, use an ordinary notehead to indicate the pitch of a multiphonic based on a given fundamental (a), or one that is to include a specific pitch or pitches (b) (Figure 3). Either give a verbal instruction to play

⁴¹ Rogier Pijper, “Whistle Tones”, <https://www.flutecolors.com/techniques/whistle-tones/> (Accessed in December 2021).

⁴² Ibid.

⁴³ Arkoudis, p. 22.

⁴⁴ David Cope, *Techniques of the Contemporary Composer*, Belmont: Schirmer Books, 1997, p. 138.

⁴⁵ Gould, p. 257.

a multiphonic or for repeated use place an “M”⁴⁶ through the stem (the “M” requires definition at its first appearance) (Figure 4).⁴⁷

Figure 3: Use of ordinary noteheads to indicate the technique of *Multiphonics*.⁴⁸

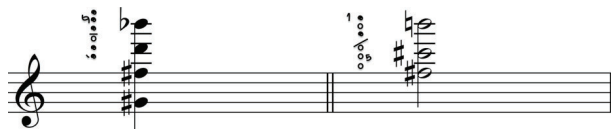
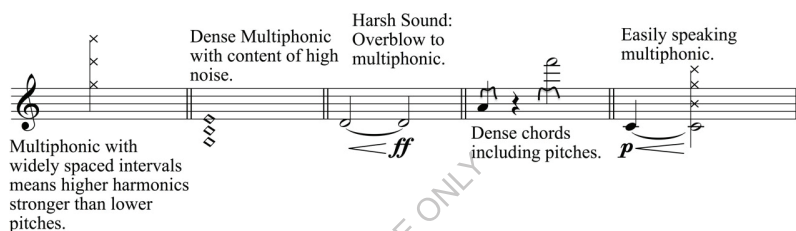


Figure 4: Different shapes of noteheads or written instructions for *Multiphonics*.⁴⁹



What is of highly importance is to remind the composer that before using a specific contemporary technique in a new composition, a very positive attitude is to think also of the performer. Many times the performer determines the work through the successful execution and interpretation of it, by giving a complete image and a specific atmosphere of the work, according to his/her experience. When the performer tries to sustain a multiphonic, the aiming between notes to achieve the sonority, tends to increase the effect of one tone becoming predominate. When alternative fingering for a single pitch is required in order to produce contrasting timbre, the fingerings are usually best left to the player, since those most suitable depend on the instrument, the player and the embouchure. Fingering is best given as a chart for the keys and/or holes. The symbols for fingering should be placed directly above or below the relevant note (Figure 5).⁵⁰

Some works which include Multiphonics are *Sequenza I* by Luciano Berio, *Solo für Flöte* by Edison Denisow, *Dorset Street* by Robert Dick, *Honami* by Wil Offermans, *Voice* by Toru Takemitsu, *Three Dances* by Alexander Wagendristel.⁵¹

⁴⁶ “M” stands for “Multiphonics”.

⁴⁷ Gould, p. 256.

⁴⁸ Ibid.

⁴⁹ Rogier Pijper, <https://www.flutecolors.com/techniques/multiphonics/> (accessed in November 2022).

⁵⁰ Ibid.

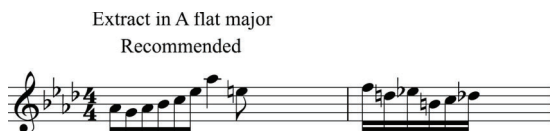
⁵¹ Rogier Pijper, “Multiphonics”, <https://www.flutecolors.com/techniques/multiphonics/> (accessed in November 2022).

1.3. Bisbigliando

The other technique that deals with the color of the note, is Bisbigliando, which is also known as *enharmonic trill*, *timbre trill* or *klangfarbentrill*.⁵² “It is a tremolo between different fingerings of the same pitch and is possible in the second and third octaves. The purpose of a bisbigliando is not to change the pitch of the note, but the color of the note, resulting a fast, shimmery change of tone color that resembles playing a trill. The technique is often indicated in the score with the word *bisbig*, along with a wavy line, or by specifying the fingering to be used.”⁵³ It is important to give the indication of *key trill* or *alternative fingerings* in order to clarify that this is not a conventional trill with the upper neighbouring note.⁵⁴ When writing enharmonic notes, it is recommended to use the key with the least number of sharps or flats in order to reduce the number of accidentals.⁵⁵

Elaine Gould describes excellent that “when the enharmonically equivalent key has an equal number of accidentals (as in F#/G flat), allocate the sharp key signature for instruments in sharp keys (in G, A etc.), the flat key signature for instruments in flat keys (in F, B flat etc.) However, incase that a transposed part has more accidentals that contradict the key signature than confirm it, consider writing it without a key signature, instead placing accidentals in front of the relevant notes as they occur.”⁵⁶ She continues saying that “in music without key signatures, the literal transposition of a sharp-key line into a flat-key instrument leads to greater numbers of accidentals and frequently to double sharps or double flats. To simplify reading, reduce the number of accidentals by judicious use of enharmonic equivalents (Figure 6). Avoid double sharps and double flats, except in a tonal context that cannot easily be rewritten enharmonically. It is often better not to respell isolated notes enharmonically if this creates diminished and augmented intervals that are awkward to read.”⁵⁷ Some composers who used the technique of Bisbigliando in their works are Robert Dick, Ian Clarke, Greg Patillo and Harvey Solberger.⁵⁸

Figure 6: The same melody is presented with less accidentals to simplify reading.⁵⁹



⁵² Arkoudis, p. 44.

⁵³ Ibid.

⁵⁴ Gould, p. 255-256.

⁵⁵ Ibid., p. 253.

⁵⁶ Ibid., p. 252.

⁵⁷ Ibid., p. 253.

⁵⁸ Emi Ferguson, “Bisbigliando”, <https://www.emiferguson.com/flutes-extendedtechniques> (accessed in November 2022).

⁵⁹ Gould, p. 252.

Extract in G sharp minor
Not recommended



1.4. Buzz Tone

Another technique that demands much pressure, is the technique Buzz Tone. If a composer wants to imitate the sound of a trumpet, then the Buzz Tone technique is recommended.⁶⁰ “It is also known as *trumpet-embouchure*. The sound is produced through the combination of lip tension, air pressure, and the space in the oral cavity, while either blowing into the embouchureholes or removing the head joint and blowing into the upper part of the flute body, as if it is a trumpet. It is usually notated with the words *trumpet attack*, *buzz* or *BZ* and its notation is considered standard.”⁶¹ This modern technique is notated with a different-shaped notehead in order to distinguish it from ordinary notes. “It is extremely important to explain a special technique in words (Figure 7). Non pitched sounds are clearest placed at the top or bottom of the stave. If groups of non-standard noteheads are difficult to read, use crosses through stems instead (Figure 8).”⁶²

Figure 7: Explanation of the technique of *Buzz Tone* in words.⁶³

Detach mouthpiece from instrument,
buzz through mouthpiece (approx. pitches)

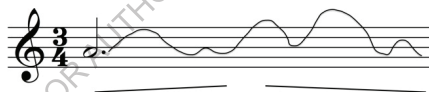


Figure 8: Alternative notation of *Buzz Tones*, using crosses through stems.



1.5. Bamboo Tones

If a composer would like to add a warm, windy sound to the flute, then the technique of *Bamboo Tones* will do the magic. A book that refers to studies dealing with this extended technique, was published by the composer and flutist Wil Offermans, who supports that bamboo tones have a warm, hollow, windy sound and are produced

⁶⁰ Howard Risatti, *New Music Signs for contemporary Music*, Illinois: University of Illinois Press, 1975, p. 28.

⁶¹ Arkoudis, p. 46.

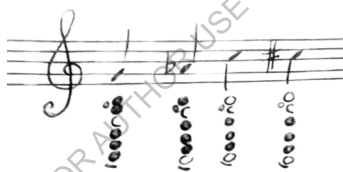
⁶² Gould, p. 248.

⁶³ Ibid., p. 249.

with different fingerings to get a different timbre.⁶⁴ They sound like tones of a bamboo flute. The fingerings of quartertones/microtones can be used. Composers will usually provide the flutist with the fingerings, but if that is not the case then Robert Dick's *Tone Development through Extended Techniques* and Wil Offerman's *For the Contemporary Flutist: Twelve Studies for the Flute with Explanations in the Supplement* are two manuals that include that information. The notation for bamboo tones is considered standard. This technique can be used on all flutes. Some works which include Bamboo Tones are *Nachtfaltergedanken* by Friedgund Gottsche-Niessner, *Drigo's dream*, *Honami*, *Studie No 4: Bamboo tones* and *Working Song 2* by Wil Offermans.⁶⁵

As a composer, I strongly recommend this kind of flute technique. I remember clearly the excitement of my flutist playing Bamboo Tones, who also advised me about the notation of this technique. My flutist also recommended to add text above the technique, giving instructions also about the embouchure and the register. Namely, the technique is also manageable in every register. The same is with the technique of *Aeolian Sound*. I asked my flutist to blow air inside the body of the instrument and she recommended me to choose register, as the air in high register is sounded differently than sounded in the middle or low one.

Figure 9: Notation of the Technique of *Bamboo Tones*.



2. Air Sound Techniques

2.1. Aeolian Sound

An air sound technique is the *Aeolian Sound*. This effect can be also named *Residual Tone* which resembles the sound of the wind. This colored air sound is produced when the flutist blows across the embouchure hole with a relaxed and unfocused embouchure. The air sound can range from extremely soft to very loud or explosive by varying the shape of the oral cavity with the use of vowels, the distance between the teeth, and the speed and angle of the air stream.⁶⁶

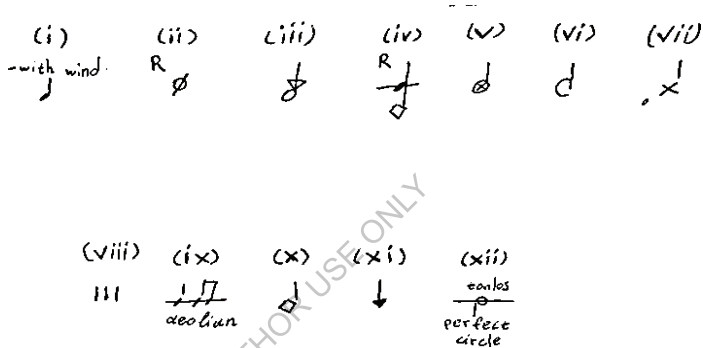
⁶⁴ Arkoudis, p.46.

⁶⁵ Rogier Pijper: "Bamboo Tones", <https://www.flutecolors.com/techniques/bamboo-tones/> (accessed in November 2022).

⁶⁶ Ibid.

More and more composers have developed an amount of different symbols in order to explain and describe this colored effect coming from the flute (Figure 10). The composers usually choose a shape of a notehead that they believe that suits best the technique and aims to help the performer understand the way of performing this effect according to the shape of the symbol. For example, a composer can choose the shape of a balloon as a notehead⁶⁸ to describe the effect of aeolian sound, as the balloon contains air. In this way, this symbol can help the flutist remember that the shape of the balloon corresponds the aeolian technique. Other composers have developed different shapes of noteheads in order to describe the same technique.

Figure 10: Symbols that indicate the technique of *Aeolian Sound*.



The above symbols were used in many works by composers who wanted to add the effect of Aeolian Sound. In fact, the signs (i) and (ix) are already used in many compositions composed for the flute. The composition *Etude op. 20: Shadows* (1979) by John Heiss, is an example where he used successfully this notation. Other works with this notation are also Shulamit Ran's *East Wind* (1988), Michael Culquhoun's *Charanga* (1993), and Christos Hatzis' *Departures Concerto for Flute and Strings* (2011). The composer Ian Clarke used a different symbol to indicate this effect. He used the capital letter R, which is the sign (ii), in all of his compositions, like *Zoom Tube* (1999) and *Great Train Race* (2000) to notate a residual tone - as he calls. Karlheinz Stockhausen is another composer who follows the same notation, who has used it in his work *Flautina for Solo Flute with Piccolo and Alto Flute* (1989). Robert Dick's symbol for the technique of aeolian sound is the sign (iv), which shares the letter R with Ian Clarke's notation, in order to indicate that it is a residual breathy tone. In Donald Erb's work *Music for Mother Bear Song for a Mother Bear* (1977) there has been used the sign (v), while sign (vi) is considered Takemitsu's way of notating aeolian sounds in *Voice for solo flute* (1971). Sign (v) has been used by Anže Rozmanin *The Dance of the Nuraghi Warriors* (2017), who has also used sign (x) with the accompaniment of words in his *Little Suite of Mythological Beings* (2010). Sign (viii) is in works by Wil Offermans and sign (iii) and (xi) can be seen in Artaud's *treatise*.

⁶⁸ See symbol (vi) in Figure 10.

Finally, sign **(xii)** is Kaija Saariaho's way of notating aeolian sound and has also been used by Robert Aitken in *Plainson* (1977).⁶⁹

A symbol that has not been included in the table above, but is also for air sounds is the one used by Maggi Payne in her work *Reflections* (2003). It is a square-spaced empty notehead, indicating that the player should produce an air pitched glissando. She also uses sign **(x)** for humming. The common symbols for air tones that the most composers prefer, are the diamond-shaped signs or triangle-shaped noteheads, namely the signs **(iii)**, **(x)** and **(xi)**. However, the diamond-shaped note heads may cause confusion, as those noteheads can also be considered as *harmonics* or *whistle tones*.⁷⁰ For this reason, it is the best that to be rejected from this discussion. Furthermore, the signs **(vi)** and **(ix)** shall also be excluded, because they can be confused with half notes and can confuse the performer when it comes to rhythmic matters. This is a very logical request, which further explains why a total of five signs have been eliminated in this process.⁷¹

According to my opinion as a composer, the most ideal signs that describes best the effect of aeolian sound, are the symbols **(i)**, **(ii)**, and **(viii)**. Even though sign **(ii)** is an empty notehead, it is combined with the letter R, which stands for Residual Tone. Nevertheless, the best way to notate *aeolian sound* successfully is to use the words "with wind" or "aeolian" or "residual tone", because the exact name of the effect on the score help the flutist understand immediately the technique and is not so confusing, in case there are more than one symbols on score. In case the composer wants to combine air with pitch, there is also developed notation. Some composers prefer to use stripes underneath the note. No sound should be used, only air.⁷² Other composers do not use the stripes, but a triangle instead. This triangle sign can also be combined with a note in order to indicate the height of the note that should be played without sound. This technique can be used on all flutes.⁷³

⁶⁹ Arkoudis, p. 67-68.

⁷⁰ See symbols (iv) and (x) in Figure 10.

⁷¹ Ibid., p. 68-69.

⁷² Rogier Pijper, "Wind Tones", <https://www.flutecolors.com/techniques/wind-tones/> (accessed in November 2022).

⁷³ Ibid.

Figure 11: Alternative Notation of *Aeolian Sound*, use of Stripes to indicate air with pitch.



Figure 12: Alternative Notation of *Aeolian Sound*, use of triangle as a notehead.

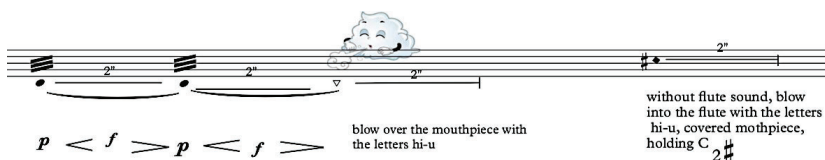


Figure 13: Alternative Notation of *Aeolian Sound*, combination of a note with a triangle through stem.



As a composer, I created my own way of describing the technique of aeolian sound. I have been experimented for some years about the techniques on the flute, thus the subject of this thesis. I thought it would be much better to insert a graphic or a drawing on the score in the shape of a cloud, in order to lead the flutist directly to the specific technique. The title of my work for solo flute is “Duo for One” and composed in 2018.

Figure 14: Alternative Notation of *Aeolian Sound*, indicated with a graphic.



In fact, the graphic is accompanied with the written instructions “blow over the mouthpiece with the letters hi-u” (Figure 14). In this way, the flutist knows exactly how to play this technique. My professors also advised me to give the instructions, not on a separate sheet, but directly on the score, in order to ease the sight-reading of the musician and make it much easier to remember the instructions during the performance.

2.2. Circular Breathing

As far as the technique of *circular breathing* is concerned, the flutist continues breathing without interrupting the flow of music.⁷⁵ The flutist Eftihia Arkoudis says that “someone who has mastered this extremely challenging technique will be able to perform longer phrases, with essentially one breath. What is mainly involved is the mouth, the tongue, and the cheeks. For a more detailed and educational approach to circular breathing, an invaluable source is Robert Dick’s *Circular Breathing for the Flutist* (1987).”⁷⁶ This technique can be used on all flutes. Some other repertoire which include circular breathing is *For the contemporary Flutist* by Wil Offermans and *A practice book for the flute 6* by Trevor Wye.⁷⁷

Figure 15: Symbols of Circular Breathing.⁷⁸



The above three signs indicate the effect of circular breathing. The first symbol shows that the flutist should breath through the nose. The second sign indicates that the flutist should start inflating the cheeks the exact moment. The third sign describes the same as the others, but it functions also as a reminders for circular breathing because of its circular shape.⁷⁹

Of course this technique can be also performed with sound. For this reason, there are some symbols that help the flutist understand whether to combine this effect with or no sound. Some composers, as we explained earlier in aeolian sound, prefer the capital letter R for Residual Tone, the letter “aeolian” written above the notes or even the combination of a triangle with a common note. However, when it comes to the air without pitch, they prefer to use the stripes, the triangle notehead or a perfect circle as a notehead.⁸⁰

It is of highly importance to remember that there is not a standard name of this flute technique. This effect, as some other techniques, has different names. The air with pitch can be seen as Residual Tone, Aeolian Sound or Souffle, while the same effect without sound can be seen as Wind Tone, Ghost Tone, Air Tone or Breath Tone.⁸¹

⁷⁵ Arkoudis, p. 49.

⁷⁶ Ibid.

⁷⁷ Rogier Pijper, “Circular Breathing”, <https://www.flutecolors.com/techniques/circular-breathing/> (accessed in November 2022).

⁷⁸ Arkoudis, p. 50.

⁷⁹ Rogier Pijper, “Circular Breathing”, <https://www.flutecolors.com/techniques/circular-breathing/> (accessed in November 2022).

⁸⁰ Arkoudis, p. 49.

⁸¹ Ibid.

Figure 16: Air sound with pitch.⁸²

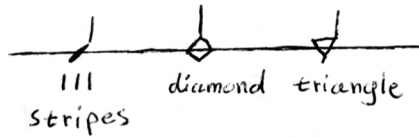


Figure 17: Written instructions for *Aeolian Sound* (from my composition Duo for One).

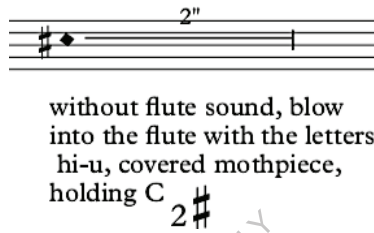
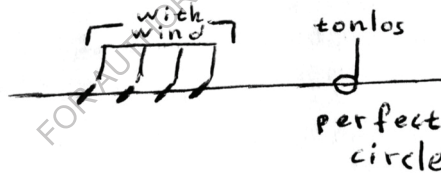


Figure 18: Air sound without pitch.



3. Percussive Effects

3.1. Tongue-Ram

Apart from the air sounds, there are also the percussive sounds. Tongue-Ram is one of them.⁸³ This technique has also other names, such as Tongue Stop or Tongue Thrust. “This extended technique is produced by completely covering the embouchure hole with the lips and rapidly extending the tip of tongue into the embouchure hole”, says the professional Greek flutist Efthia Arkoudis and she continues saying that “this technique is the most successful when the movement of the tongue is accompanied by a forceful exhalation of air, like a thrust. The sounding pitch will be a major seventh below the fingered note for a concert C flute, a major or minor seventh below the written pitch on an alto- and bass-flute, and a minor ninth below for the piccolo. Many flutists find it helpful to think of the word “Hot” or “ht” in order to achieve the “pop” sound that derives from the technique. For this reason, some composers may use the letters *H.T.* to notate it, among many other notational signs that have been developed through-

⁸² Arkoudis, p. 51.

⁸³ Ibid., p. 51-52.

out the years, making its notation non-standard.”⁸⁴

This technique can be used on all flutes. However, the sound is weak and sounds a minor ninth lower than the fingered tone on piccolo. Regarding the C-flute, the technique is also weak and sounds a major seventh lower. This effect is ideal on alto flute and sounds a major seventh lower than the fingered tone. Finally, this technique is very suited on bass flute and sounds a minor seventh lower than the fingered tone. Tongue Ram becomes difficult to play when it comes to fast or long passages. It becomes even more difficult to execute if it is alternated with the regular sound.⁸⁵

Figure 19: Notation for the technique of *Tongue-Ram*.

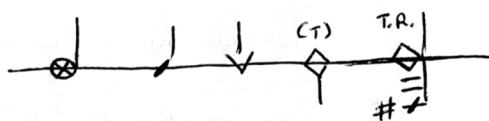


Figure 20: Notation for the technique of *Tongue-Ram* with embouchure hole covered.



3.2. Pizzicato

Another technique that deals with the tongue is the pizzicato effect. Pizzicato, or also known as tongue slap, is a percussive effect inspired from the pizzicato technique for the strings.⁸⁶ There is the tongue pizzicato and the lip pizzicato. If you are a composer who cannot play the flute, it is of highly importance to ask for advice from a professional flutist when it comes to the execution of this modern technique, as there are many ways to describe it. I will quote Arkoudis' words for once more, since she is a professional flutist in this modern repertoire. She says clearly that "tongue pizzicato produces a hard articulation (letter T) by being placed between the lips or against the hard palate behind the teeth. The sound produced has a dry quality. With lip pizzicato, the flutist must press the lips hard against each other and allow the air to separate them apart, to produce a [pa] percussive sound. This sound should have more of a wet quality. For both, there is no air stream from the lungs involved; therefore, this technique produces a pitch resonance in the first octave only, low B- middle D#. The choice de-

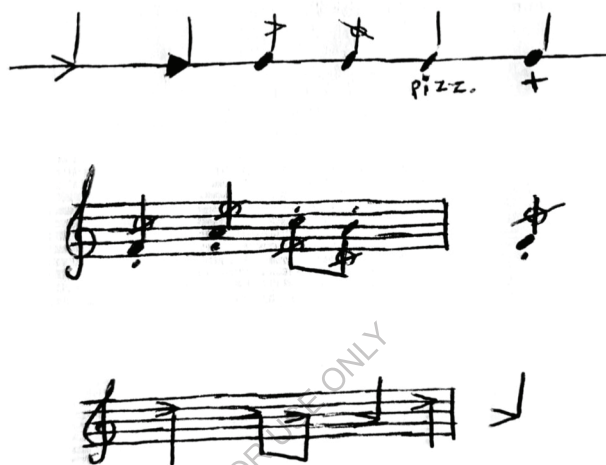
⁸⁴ Ibid.

⁸⁵ Pijper Rogier, "Tongue-Ram", <https://www.flutecolors.com/techniques/tongue-stopram/> (accessed in November 2022).

⁸⁶ Arkoudis, p. 52.

depends on the performer's mouth physiology and playing abilities, as well as the nature of the work. Even though the word *pizzicato* is often used to notate this technique, it has acquired multiple signs over the years, making it yet another technique with no standard notation."⁸⁷

Figure 21: Alternative notation for the technique of *Pizzicato*.



Pizzicato can be used on all flutes. However, it can be used in the first and second octave of the flute. The composer writes “l.p.” in the score for *lip pizzicato* and “t.p.” for *tongue pizzicato*. This effect becomes difficult to play when it comes to fast or long passages. Specifically, *lip pizzicato* is more exhausting if it is alternated with the regular notes.⁸⁸

3.3. Jet-Whistle

If the composer wants to create a loud sound on the flute, then the technique of *Jet-Whistle* is ideal. This effect is also known as *jet* or *air jet* and is a loud attack of air reminiscent of a jet plane.⁸⁹ “The flutist must seal the embouchure hole of the flute with the lips while forcefully exhaling a thrust of air into the tube. The pitch, tone quality, volume, and duration of the jet whistle are affected by the choice of fingering, breath pressure, vowel shape of the mouth, and angle of the embouchure hole relative to the lips. Composers should have in mind, that the lower the pitch that is fingered, the richer

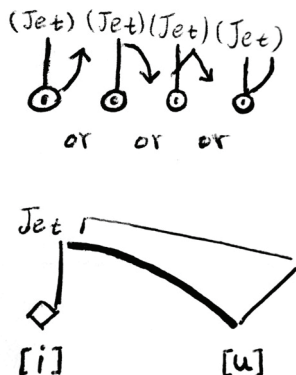
⁸⁷ Ibid., p. 52-53.

⁸⁸ Rogier Pijper, “Tongue Ram”, <https://flutecolors.com/techniques/pizzicato/> (accessed in November 2022).

⁸⁹ Arkoudis, p. 53.

the frequencies that are produced. Its notation is usually the words themselves combined with a downwards or upwards line.”⁹⁰

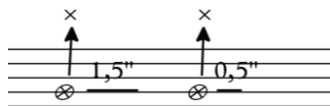
Figure 22: Alternative notation for the technique of *Jet-Whistle*.



This technique can be used on all flutes. However, it becomes more difficult to play at the end of a phrase, especially when it comes to repeat the technique (breathing) or in case it is alternated with regular sound. Some works which include this effect are *Flute solo 2* by Heinz Holliger, *Studie No 9: Diverse for the contemporary flutist* by Wil Offermans, *Three dances* by Alexander Wagendristel.⁹¹

In case of my work “Duo for One” for flute and voice, I prefer to indicate the technique of Jet-Whistle with an arrow above a circular shape of notehead with an X inside. What I did differently, was to indicate also the time from the one Jet-Whistle to the other (Figure 23), because if there is more than one Jet-Whistle on the raw, the flutist may find it difficult to breathe and get dizzy. The best way to avoid it, is to leave time and let the flutist breathe normally. The ideal solution would be to discuss it with the flutist.

Figure 23: The technique of *Jet-Whistle* with time indication.



If the composer wants to indicate how much pressure or strength the flutist needs to put, then it is a good choice to give direction to the arrows. If the arrow goes up, it means to start with low pressure and increase the airstream progressively (Figure

⁹⁰ Ibid., p. 89.

⁹¹ Rogier Pijper, “Jet Whistle”, <https://www.flutecolors.com/techniques/jetwhistle/> (accessed in November 2022).

24). However, if the arrow goes down, the flutist understands to start playing with a lot of pressure and start decreasing the airstream progressively (Figure 25).⁹²

Figure 24: Low to high pressure indication of *Jet-Whistle*.

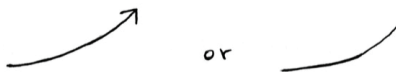


Figure 25: High to low pressure indication of *Jet-Whistle*.

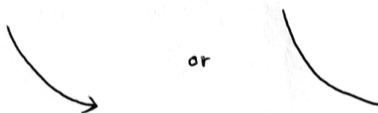
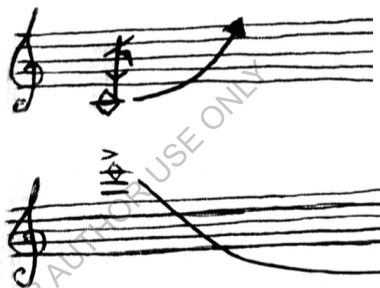


Figure 26: Combination of arrows with notes.



4. Vocal Techniques

4.1. Singing and Playing

In my work “Duo for One” the flutist is called to combine her voice with the flute sound in such way that both voices – flute voice and human voice – are combined harmonically creating a musical duo. When the flute is combined with human voice, the outcome can be very impressive. According to Carin Levine and Christina Mitropoulos-Bott, the technique of singing and playing is produced when “the vocal chords rub against one another (as in speaking) while simultaneously exhaling; air flows out through the larynx into the flute.”⁹³ This effect is nothing more than multiple sonorities. It is important as composers not to forget that the producing sound can vary according to the flute pitch and the vocal range of the flutist. For this reason, the composers often choose which intervals the flutist should sing at the same time, because the aim is to emulate a specific sound effect.⁹⁴ This technique can be performed either as parallel singing (singing and playing the same pitch unison or in octaves), or as polyphonic singing (singing a separate melody and playing another, usually in intervals

⁹² Ibid.

⁹³ Arkoudis, p. 55.

⁹⁴ Ibid.

of thirds, fourths, or fifths). Another way is to hold a steady flute pitch as unison while singing a sequence of pitches.⁹⁵

Generally, in singing and playing, the voice has the leading role, which is also preferable, while the flutists should mind the intonation between the voice and flute pitch, if they wish to avoid producing a “noisy” timbral sound. Of course, this would be an exception if the composer requests that kind of timbre.⁹⁶

The use of vowels enhances the success of this effect. Robert Dick has created excellent exercises for this purpose and named the term for this practice “throat tuning”.⁹⁷ The most common form of notation is the notation of this effect in two systems of which the first system represents the flute. However, it is very usual for composers to notate both in one system, where the sung part can take ordinary notes, with each entry to be labelled *hum* or *sing*.⁹⁸ Of course, the best way is to use cue-sized noteheads to differentiate the sung pitches.⁹⁹ Place both sung and played pitches on the same staff, as long as there is room among the systems.¹⁰⁰ In case it gets confusing to have both parts on one staff, use ordinary notes for both parts and place the sung notes on a separate staff below the played notes.¹⁰¹ “A verbal instruction must take it clear that the player fingers the pitches and speaks through the instrument”, says Elaine Gould in her book *Behind Bars*.¹⁰²

According to my experience as a composer, I strongly recommend to notate the instructions directly on score, in order to help the performers memorize them efficiently. Moreover, this way functions as reminding marks during the performance.

In case the composer notates *singing* with a different shape of notehead, it is advisable to give a written instruction, writing the word “sing” below the note.¹⁰³

Figure 27: The word “sing” below the note.



⁹⁵ Arkoudis, p. 55.

⁹⁶ Ibid.

⁹⁷ Ibid.

⁹⁸ Gould, p. 250.

⁹⁹ Ibid.

¹⁰⁰ Ibid.

¹⁰¹ Ibid.

¹⁰² Ibid.

¹⁰³ Gould, p. 251.

Other composers tend to use two different staves for the flute and voice, respectively. Others, on the other hand, prefer to use one stave, as long as there is enough space among the systems.¹⁰⁴

Figure 28: One stave for the technique of *Singing and Playing*.

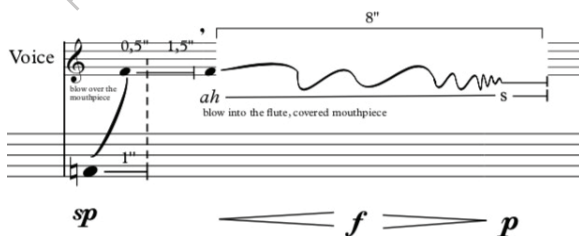


Figure 29: Two staves for the technique of *Singing and Playing*.



In my work “Duo for One” I used two staves and chose to indicate the singing part with smaller notes, accompanied with the instructions “blow into the flute, covered mouthpiece”, as shown below (Figure 30).

Figure 30: The singing part is indicated with smaller notes.



4.2. Speaking and Playing

For speaking and playing, it is ideal to use crossed noteheads to notate speaking through the instrument. However, if it gets difficult for the flutist to read the groups of crossed notes, then use a cross through stems.¹⁰⁵ Also use a different shape of notehead (crossed) even if the text is entirely independent of the instrument. In this case, the spo-

¹⁰⁴ Ibid., p. 251.

¹⁰⁵ Ibid., p. 250.

ken text should be labelled as *spoken*,¹⁰⁶ while the sung text as *sing*.¹⁰⁷

Figure 31: Speaking and playing rhythmically.

Flute

sha ka sha ka sha ka sha sha ka sha sha ka sha

2

sha ka sha ka sha ka sha ka sha ka sha ka sha ka sha ka sha

Figure 32: Speaking and playing in two staves.

mp

ka-po-te i - ta-ne fe-ga-ra-ki ka - po-te o-lo-la-bro i - ta-ne.

Figure 33: Combination of headless notes with letters for speaking while playing.

B PS K TS K TS PS K TS

Figure 34: Spoken words over the mouthpiece with pitch.

La lu - mi - na, la lu - mi - na, la lu - mi - na.

¹⁰⁶ Ibid.

¹⁰⁷ Ibid.

Figure 35: Speaking while blowing across the mouthpiece.

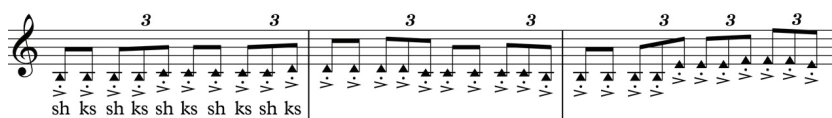
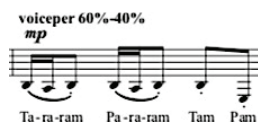


Figure 36: Speaking and playing (from the performance “The Silent One” of the Greek composer Dimitra Trypani).



Dimitra Trypani is a living composer, comes from Greece and she has been searching techniques about human voice for many years. She has developed, eventually, her own technique, which I personally find very clever, of combining whisper and voice at the same time. She named her technique “voiceper” from whisper and voice. When she teaches her musicians about this technique, she uses the scale of percent (%), describing both techniques as one, like 60% voice and 40% whisper, or 80% whisper and 20% voice. In this way, the musicians can imagine the desire of the composer, when it comes to the technique of voiceper.

Figure 37: The technique of *voiceper* by Dimitra Trypani in her work “The Silent One”.



4.3. Vocalization of Phonemes / Syllables

4.3.1. International Phonetic Alphabet (IPA)

Nowadays, more and more contemporary composers tend to use a large range of phonemes in order to modify the timbre. A composer usually gives instructions to the flutist to whisper, speak, sing, hum or whistle through the instrument in order to modify or even amplify the sound. There is, of course, the combination between the techniques, like Jet-Whistle, and simultaneously changing vowels in embouchure.¹⁰⁸

¹⁰⁸ Gould, p. 252.

What happens when it comes to international matter? The composer can use instructions according to International Phonetic Alphabet in order to describe the pronunciation of each word. In this way, a musician can speak or sing successfully greek, german, english, french or italic text.

The forming or changing of vowels or phonemes in the embouchure during a blown note, results in a change of tone quality. A composers can indicate the vowels or phonemes, that are to be used, below the stave in square brackets. In this way, the musician knows exactly which phoneme to speak or sing in each note. For better results, it is also advanceable to qualify in a footnote the pronunciation of vowel sounds with reference to a language familiar to the player (e.g. i = ee as *seen*, u = oo as *soon*).¹⁰⁹

The Phonetic Symbols of IPA are equivalent to English, French, German and Italian sound.¹¹⁰ As mentioned above, this system can also be adopted to other languages, like Greek. It is, namely, very easy to describe the pronunciation of almost any foreign words, as the vowels are divided into groups according to the neutral vowels, the front vowels, the back, the semivowels, the vowel glides, the laryngeal or oral migrations of vowels, the continuant fricatives, the affricates and last but not least the nasal migrations of vowels. That means, that if a composer desires to use foreign language or even the language of his/her nationality, it is very easy and also efficient to do so, as the description is based on the IPA, which also can be proved to be useful for the performer. An easy way to show the exact time that the performer speaks the vowels or phonemes, is the placement of arrows above the stave.

Figure 38: Meaning of arrows.

Voices



: the arrows show the distance between the one voice to the other



: the vertical arrow shows where the voice speaks

The International Phonetic Alphabet is very helpful when it comes to the description of a foreign alphabet and according to my opinion as a composer, I advise both the composers and performers to become familiar with this system.

¹⁰⁹ Ibid., p. 249.

¹¹⁰ "International Phonetic Association",

<https://www.internationalphoneticassociation.org/content/full-ipa-chart> (accessed in September 2022).

Figure 39: The IPA

INTERNATIONAL PHONETIC ALPHABET

Phonetic Symbols with Equivalent Sounds of English, French, German and Italian

IPA SYMBOLS			ENGLISH	FRENCH	GERMAN	ITALIAN
<i>THE NEUTRAL VOWEL</i>						
[ʌ]	up	[ʌp]	me	[mʌ]		
<i>THE FRONT VOWELS</i>						
[i]	eat	[it]	fil	[fis]	viel	[fil] si [si]
[ɛ]	pet	[pɛt]	tete	[tɛ:t]	des	[dɛs] bello [bɛl:o]
[æ]	pat	[pæʔ]				
[a]	lamb	[lam]	glace	[glas]	[habɛ]	[habʰ]
<i>THE CENTRAL VOWELS</i>						
[ɛʔ]	early	[ɛʔ]				
[ɑ]	palm	[pɑm]	âme	[ɑ:m]	paar	[par] amare [amare]
<i>THE BACK VOWELS</i>						
[u]	food	[fud]	fou	[fu]	tun	[tu n] kura [kura]
[ʊ]	foot	[fʊʔ]			mund	[mʊnt]
[o]					so	[zo:] otto [t:o]
[ɔ]	all	[ɔll]	coq	[kɔk]		motto [m)t:o]
<i>THE SEMI VOWELS</i>						
[w]	witch	[witʃ]	oui	[wi]		uomo [w)mo]
[j]	you	[ju]	hier	[jɛ:r]	ja	[ja] ieri [jeri]
[l]	law	[l]	les	[le]	legen	[leg)n] la [la]
[r]	raw	[r]			reiten	[raitn] ricco [rik:o]
<i>THE VOWEL GLIDES</i>						
[au]	now	[nau]			haus	[haus] causa [kausa]
[ou]	no	[nou]				
[ɛi]	day	[dei]				
[ɔi]	boy	[bɔi]			fever	[fɛier]
[ai]	lie	[lai]			zeit	[tsait] mai [mai]
<i>LARYNGEAL MIGRATIONS OF VOWELS</i>						
[h]	hop	[hɔp]			hat	[hat]
[hj]	hue	[hju]				
<i>ORAL MIGRATIONS OF VOWELS</i>						
[p]	pat	[paet]	pas	[pas]	pressen	[prɛsɛn]
[b]	bat	[baet]	bête	[bɛt]	bett	[bet] barca [barka]
[t]	two	[tu]	ta	[ta]	tal	[tal] tempo [tempo]
[k]	class	[klaes]	que	[k]	könig	[kɔnɪk] che [ke]
<i>THE CONTINUANT FRICATIVES</i>						
[f]	fife	[faif]	femme	[fam]	fahren	[fa:rɛn] facile [fatʃil]
[v]	five	[faiv]	vous	[vu]	was	[vas] verso [v rso]
[θ]	bath	[baθ]				
[s]	sue	[su]	ses	[se]	das	[das] si [si]
[z]	zoo	[zu]	zele	[ze:l]	seele	[ze:le] casa [kaza]
[ʃ]	mission	[miʃɛn]	creche	[kre:ʃ]	spass	[ʃpas] fascisti [faʃisti]
[ʒ]	vision	[viʒɛn]	jamais	[ʒa'mɛ]	charge	[ʃarʒe]
<i>THE AFFRICATES</i>						

[tS]	church [tSɛts]	klatch [klatS]	cera [tSɛra]
[St]	rushed [ruSd]		
[dʒ]	judge [dʒʌdʒ]	gente [dʒɛnti]	

THE NASAL MIGRATIONS OF THE VOWELS

[m]	mow [mo]	mons [mɔ̃]	memel [me:mel]
[n]	no [no]	non [nɔ̃]	nun [nu:n] vano [vano]

4.3.2. Description of syllables without the IPA

What is challenging for a composer who is not familiar with the International Phonetic Alphabet or an amateur player, is to describe the syllables successfully without using the IPA. What a composer can do, is to qualify the sounds according to a familiar language and indicate in the preface.¹¹¹

When the syllables of a word are divided between different voice parts and the complete word is not obvious, qualify the sound of an isolated syllable by providing the whole word in a footnote, which ensures correct pronunciation.¹¹²

Text sounds without linguistic meaning (known as phonemes) that are independent from surrounding text, may be written in *italic* in order to avoid confusion with the text. However, if the composer wants to reserve *italic* for expression marks, then the phonetics letters may be placed in square brackets.¹¹³

Figure 40: Text based on IPA.

Flute

ce - ra ca - sa va - no
[tSe - ra] [ka - za] [va - no]

Flute

bel-lo ku-ra bel - lo si
[bɛ:l:o] [ku-ra] [bɛ - l:o] [si]

Flute

so rei-ten ja so rei-ten so viel
[zo:] [rɔi:tn] [ja] [zo:] [rɔi:tn] [zo:] [fil]

¹¹¹ Ibid., 452.

¹¹² Ibid., 453.

¹¹³ Pierre Boulez and Jean Jacques Nattiez, p. 47.

Figure 41: Text or Phonemes without the IPA.

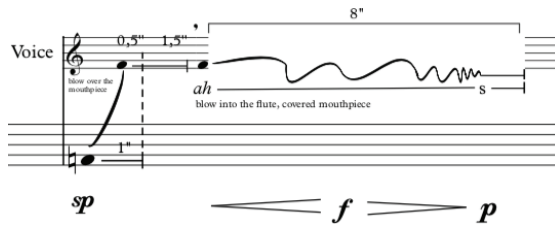


Figure 42: Text or Phonemes without the IPA, providing footnotes.



4.3.3. Changing vowels

An arrow between vowels indicates a gradual change of vowel. The arrow also shows the length of the transition between one vowel and the next. Despite a vowel change, each note with unchanged pitch may be tied, indicating no separate articulation.¹¹⁴ The flutist or any performer can navigate vowel or text-containing works easily and quickly with clear and detailed instructions. The composer succeeds in using and giving not only the definition, but also the placing and of course the use. Where practical, definitions are given where terminology is unusual or even confusing, while the text is handled as a progression from the elementary to the complex. "Terminal text that is in a foreign language are used where they are in common usage in the English-speaking world (as shown above) and such terms are often presented in the usage in *italics*, although they might appear in roman type in a musical context."¹¹⁵

I agree with Elaine Gould, who says that "effective communication results from establishing a convention and adopting a consistent approach. Where new conventions are not established we make our own recommendations. Our aim is to raise awareness

¹¹⁴ Ibid., p. 450.

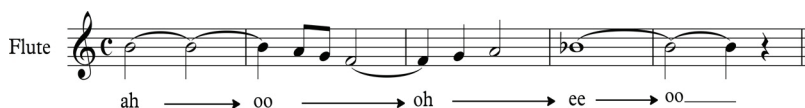
¹¹⁵ Gould, p. xiv.

of the many subtle and complex issues to be considered, and provide the tools to address them.”¹¹⁶

Figure 43: Placing an arrow between vowels, while singing and playing.



Figure 44: Changing vowels.



4.3.4. Consonants

Divided syllables instruct the singer to sing consonants separately. It is often effective to notate the whole syllable first, so that the word is immediately intelligible, then to add the consonants in round brackets where they are to be placed.¹¹⁷

“When the consonant sound has more than one pitch, use separate syllabic slurs to clarify the duration of the sustained consonant; a second set of slurs indicates that there is no break in sound from the previous vowel and makes it easier to see the whole syllable”¹¹⁸, advises Elaine Gould.

It is necessary to provide clarification in a footnote for immediate transitions to sustained consonants, such as close onto final consonants immediately.¹¹⁹ Alternatively, place the consonant in brackets after the syllable. Consonants are especially useful when they do not correspond to the word's final letter.¹²⁰

Figure 45: Sustained syllabic slurs.



¹¹⁶ Ibid., p. xv.

¹¹⁷ Ibid.

¹¹⁸ Ibid., p. 453.

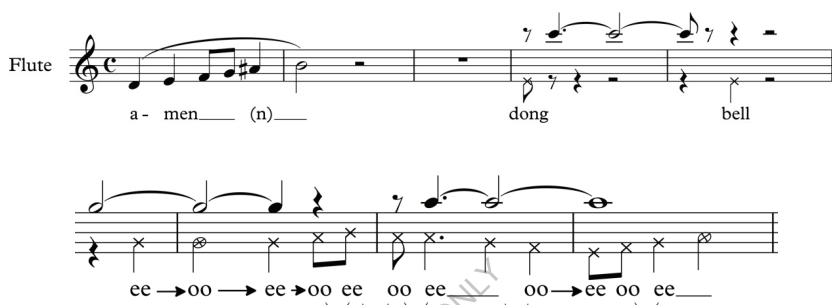
¹¹⁹ Ibid.

¹²⁰ Ibid.

Figure 46: Underlined consonants for immediate transition.



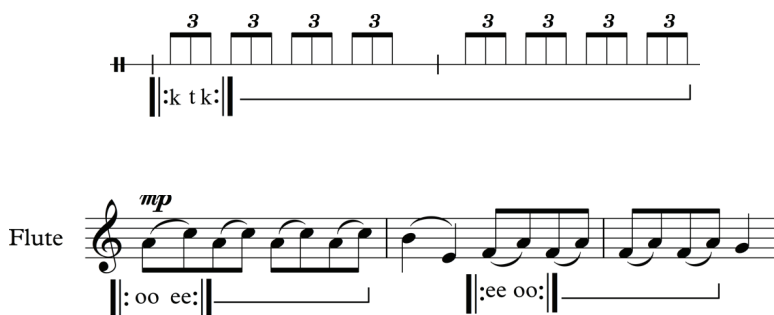
Figure 47: Consonants with more than one pitch.



4.3.5. Repeated Phonemes

For compositions that include repeated fragmented syllables, a composer should take into account a much more unconventional way of treatment. In addition to repeating text, repeated signs and barlines can be attached. In this case, enclosing the text or syllables in repeated barlines and extending the bar length to accommodate the length of the text is the best way to do it.¹²¹

Figure 48: Repeating text or syllables.



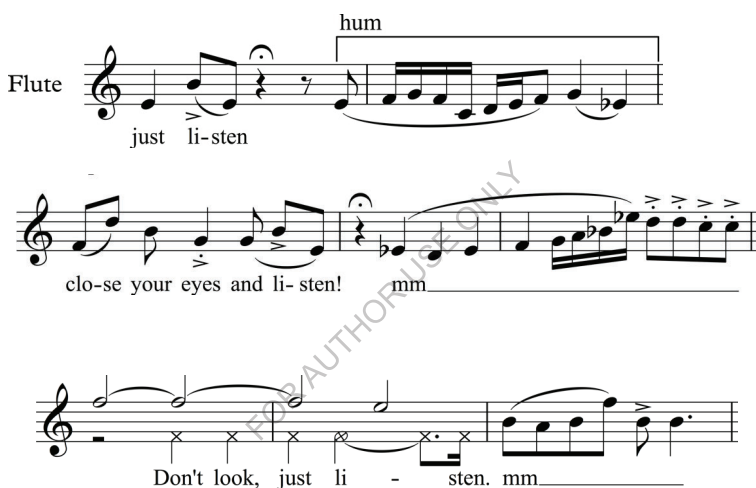
¹²¹ Ibid., p. 454



4.3.6. Humming

Humming is another technique for voice, where the performer is humming through the instrument. Humming is indicated by verbal instruction *hum*. It is important to place the instruction.¹²²

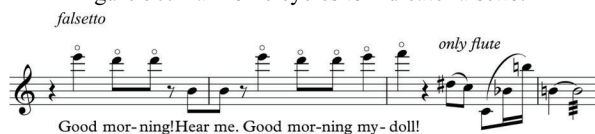
Figure 49: The vocal technique of humming.



4.3.7. Falsetto

“Falsetto is most often used in the context of singing to refer to a type of vocal phonation.”¹²³ It is possible for flute players to sing notes beyond the vocal range of standard or modal voices through their instruments. Falsetto should be indicated over the relevant notes in a harmonic cycle. For clarity use the instruction *falsetto* at its first appearance. It is also acceptable to use diamond noteheads for falsetto as long as there is an accompanying explanation.¹²⁴

Figure 50: Harmonic cycles to indicate falsetto.



¹²² Ibid., p. 455.

¹²³ Howell, p. 156

¹²⁴ Ibid.

CHAPTER THREE

Approaching the Notation of Electronics

“Our alphabet is poor and illogical. Music which should pulsate with life, needs new means of expression, and science alone can infuse it with youthful vigor. Why Italian Futurists, have you slavishly reproduced only what is commonplace and boring in the bustle of our daily lives. I dream of instruments obedient to my thought and which with their contribution of a whole new world of unsuspected sounds, will lend themselves to the exigencies of my inner rhythm”¹²⁵, are the exact words of Edgard Varèse, trying to express his thoughts that he is an artist ahead of his time, who explored the musical outer space reaching another aspect of music. More and more composers prefer to avoid the standard music notation and choose to follow a different way of scoring. The diagrams, the lines, the drawings or even the shapes such as big squares are chosen by the modern composers to describe the dynamic, the duration, the amount of notes and articulation of the melody. Sometimes an image means a thousand words.¹²⁶

Electronics are notated in scores so that the treatment, attack time, duration, dynamics, and pitch are all described. In addition to the information on the process and notation of the technology, computer and performer are provided with interpretative notation, including descriptions of gestures, fader control indications, and relative dynamics between competing effects. Not only does the score provide enough information to perform the work, but there is enough documentation or archival information to allow for an eventual translation to newer technology when the time comes.¹²⁷ Of course, there are also animated notations as a new direction for music notation. Many composers find this kind of notation very exciting and a revolutionary way of scoring.¹²⁸ In other words, the animated score is considered as a modern tool that excites not only the creators, but also the performers developing a great mood for rehearsals, as it is not so usual. These performance practices in new music are considered as the “third way” according to Gerhard E. Winkler, among standard scoring and improvisation.¹²⁹ Winkler’s thinking is based on the realtime-score theory, that there is a computer screen as a traditional note-stand during a performance.¹³⁰ Things get even more exciting when the program becomes interactive. Animated notation can be presented as an interactive video or interactive application. In my case, as a composer, I created an animated video which contains a graphic score in puzzle pieces (Figure 51). The video shows one piece of the puzzle each time, in which every

¹²⁵ Richard Kostelanetz, Joseph Darby, Matthew Santa, *Classic Essays on Twentieth-Century Music: A Continuing Symposium*, London: Schirmer Books, 1996, p. 391.

¹²⁶ Brian Leo Fennelly, “A descriptive notation for electronic music”, PhD. Diss., Yale University 1968, p. 8.

¹²⁷ Faia, p. 59-60.

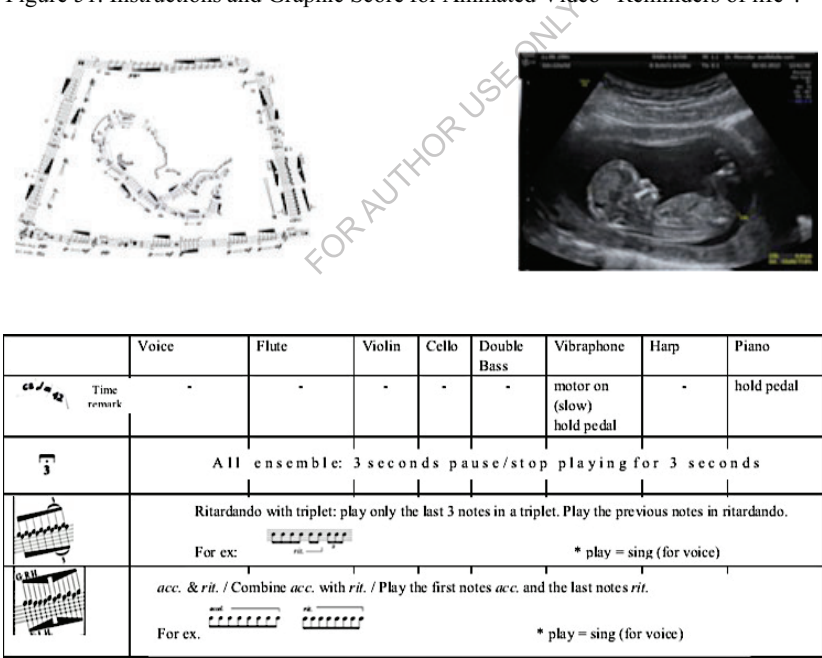
¹²⁸ Fennelly, p. 127.

¹²⁹ Gerhard E. Winkler, *The Realtime-Score, A Missing-Link in Computer-Music Performance*, Salzburg, p. 1.

¹³⁰ Ibid.

musician interacts according always to his / her improvisation skills. Although this work of mine is not based on improvisation, I let some musicians improvise, according to the passages shown in the video. I also provided instructions to those musicians were afraid to improvise or feel insecure. In this way, the musicians learn their inner self in interpreting music. This work is an animated video, is entitled “Reminders of Life” and I gave specific instructions to the flutist to whisper the word “life” inside the flute, accompanying it with Whistle Tones. Sometimes the flutist speaks the words “father” and “mother” inside the instrument, because the parents create life which is considered a present by God, combining these words with the technique of Circular Breathing. Since this work is about life, I used the flutist’s voice and the ensemble’s breath to create a living environment, an environment that there is not just one life, but many other souls as well. All these instructions and techniques are given in a single animated video through synchronicity, symbols and the colors. It is very important as composers to understand whether to use standard notation or electronic notation. We need to decide which way is the best to communicate with the performers and give away our thoughts to the audience.

Figure 51: Instructions and Graphic Score for Animated Video “Reminders of life”.



What is efficient about graphic illustration, is the description of contrast and change of timbre, because it is difficult to get these characteristics fit into traditional notation. Through electronic notation a composer can illustrate duration of textures,

pitch and other aspects of sound using proportional spacing principles.¹³¹ For instance, if a composer creates a work with all the kind of flute from the flute family, then the composer can change the ensemble's contour by changing pitch spectra. If a pattern can represent a line, then many patterns can represent a different texture by cross-hatching lines. This is nothing else than using shapes. Instead of notes, there are shapes like lines, squares, triangles or dots. It is not difficult to represent a pattern to a shape. The use of shapes is just a parallel language of music. If there is one pattern, there is one shape. For many different patterns there are many different shapes. A pattern is determined by the composer, who corresponds it to a shape, according to his/her desires. Of course, density plays an important role in electronic notation. The composer can play with the size of the shapes from enlargement to reduction in order to describe the dynamic. The bigger a shape is, the louder the sound is. For illustrating the pitches, the composer can also play with the width and height of the shapes. Especially the width, reflects the pitch range, as the high frequency is usually at the top.¹³²

"Of special interest are the lack of bar lines and the precise time which is given in seconds. This gives clarity, precision and ambiguity inherent in electronic notation."¹³³ If a composer creates a work for the flute – or any other instrument – that lacks discernible pulse or in case that the musical material does not fit into conventional metrical patterns, then using proportional spacing may seem ideal. In other words, time-space notation can simplify the electronic part and also help the performers read their lines at the same time. Proportional spacing is nothing else than leaving space between the notes, describing duration. Of course, everything depends on the function. If, for example, the time is important, a composer should take into consideration the use of stemless noteheads as an efficient notation. If, on the other hand, it is important to indicate sustained duration, then the use of extenders after noteheads is an ideal method.¹³⁴ Pattern-matching lists of notes and durations for motive recurrences and their variations can contribute to convincing iterations of today's music in established styles. Let us have in mind that a signature is a motive used by a composer in more than one work.¹³⁵

Whenever possible, electronic components should be positioned in a score in a way that allows not only the performers, but also the technician, if necessary, to see and read them. But what is the best position to place the electronic part on score, when writing for flute and electronics?¹³⁶ The electronic part is usually placed at the bottom of the score when there are written instructions for the technician or when there is a pre-recorded part. Furthermore, the technician can see much easier how to balance the sound while following the individual parts. Nevertheless, if there are cues of electronic sound, place them above the line of the instrument.¹³⁷ Of course, the

¹³¹ Gould, p. 595.

¹³² Ibid.

¹³³ Carla Faia, *Notating Electronics*, London: Brunel University, 2019, p. 49.

¹³⁴ Gould, p. 595.

¹³⁵ Cope, p. 199.

¹³⁶ Not only for flute and electronics, but also for any solo instrument combined with electronic part.

¹³⁷ Ibid., p. 596.

representing configurations of software settings program changes, patch numbers) should appear at the point at which they occur. However, if there are separate instrumental parts, it is really helpful the program changes or patch numbers to appear at the end of the previous passage and at the start of the new passage, for rehearsal purposes. Another way would be to place them at the top of each page. If necessary, place a verbal description to help the performer and technician understand the content of the performance. Avoid to describe the textures on the score by adding too much information, because those information have a distractive part. For this reason, add only the basic information on the score and the extra on the preface.¹³⁸ The flute example below, shows the changes of footpedal program with short verbal description.

Figure 52: Operational Instructions.



Some composers prefer to put the electronic part between brackets in order to ease the eye of the performer and avoid confusion. In this way, they include the different timbres into brackets. In fact, many composers have used the square brackets to indicate the different texture. It is advisable to use a cue-sized staff to indicate the performer's part and distinguish it from the electronic part. In this way, the musician's line stands out.¹³⁹

Regardless of the many varied developments around the fundamental elements of music, the flexibility of the music staff to bend to any use is a strong recommendation to the continued use of it for notating electronics.¹⁴⁰

Notate normally the dynamics for electronic sounds, so that the technician can balance the volume levels. In case the work is about pre-recorded or live-processed sounds, a composer should also state whether the balance of performer and electronics should be equal. It actually depends on the composer's desires, because the performer's dynamics may affect the electronic transformation or maybe the pre-recorded sounds should be notated in fader levels adjusted by the technician.¹⁴¹

¹³⁸ Ibid., p. 604.

¹³⁹ Ibid., p. 597.

¹⁴⁰ Faia, p. 45.

¹⁴¹ Samuel Adler, *The Study of Orchestration*, New York: Norton & Sons, 2002, p. 795.

To facilitate rehearsal, composers should include timing points above the electronic part if there are important parts in the performance. In a graphic illustration, place equidistant intervals of time across the page to illustrate the relationship between time and space. In my work “Mariana’s Gaze” which consists of pre-recorded sounds, I used framed timings above the relevant staves. However, in case of a piece that requires co-ordination with an acoustic performer, a composer should use cumulative timings by following a stopwatch or equivalent. Since the player must follow a stopwatch, it is best to include the timings above the performer’s line, framed into box for clarity purposes.¹⁴²

Music analysis modules are usually included in interactive composition software, along with an interface for the human composer. Such interfaces often take the form of standard notation or even of a graphic. The performer does not need to know how exactly interactive programs function. The aim here is to examine how the producing music fits together with the musician. David Cope said that “some composers feel that this kind of process, sharing composing responsibilities with computers, has a great potential as a future composition model”.¹⁴³

A composer can also find delay effects pretty fascinating and include them in his/her composition. If essential information for coordination is present, simplify the notation of delay lines. Take into consideration to notate the delay lines on cue-sized staves below the performer’s staff. It may be sufficient to indicate where input (recording) and output (playback) occur, in case scoring is seemed to be very complex. As mentioned above, indicate the important instructions on the score, such as where to start and stop the recording or input levels, where to start or stop the playback or output levels and feedback levels, if employed. Processing parameters like filter frequency or reverberation need to be precisely synchronized with the acoustic sound. As opposed to notating the resultant sound, Ferneyhough prefers to draw a continuous line to represent the control of each delay line. This would provide too much complex information. In his work *Time and Motion Study II*, he uses a band of vertical shading above the line to indicate the recording level, a band of diagonal shading to show the playback level and a separate thick black line to represent the feedback level.¹⁴⁴

To ensure effective performance, a detailed list of the equipment must be provided. What plays a vital role, are also the diagrams which can help explaining how equipment is to be set up.¹⁴⁵ In general, In addition to specifying the number of technicians needed, the composer must create a diagram showing how the equipment will be set up, the location of loudspeakers, the mixing desk, and the performers. Where computers are used, we need to provide specific details of both hardware and software and other information, such as the type of synthesizer (if needed), the keyboard range, the foot pedals, or the number and type of controllers (ex. pitch-bend wheel, sensitive keyboard, after-touch). In case of using a pre-recording material (fixed media), the technician activating the recording needs to know where to start or stop the recording and how long the recording lasts, including the dynamics, to balance with acoustic

¹⁴² Ibid., p. 600.

¹⁴³ Cope, p. 203.

¹⁴⁴ Ibid., p. 603.

¹⁴⁵ Ibid., p. 602.

instruments or voices. In case of indicating the starting or stopping point of a recording, it is advisable to use brackets on the stave. Indicate the starting point by opening the bracket and indicate the stopping point by closing it. All the used sound files must be numbered and framed above the stave (① below = Track 1).¹⁴⁶

If a MIDI sequence is included, it can be triggered either by a technician seated at a computer or the flutist by using a footpedal. Elaine Gould gives excellent advice when she says that “in order to activate a midi sequence, indicate a framed instruction at the starting point. The only thing to do is just to align the framed instructions precisely there, where the sequence should start. What is also advisable is to divide rests, if necessary. Of course, a horizontal or wavy line on staves may be used in order to indicate the length of a sequence. If the conductor or flutist needs to follow a particular point in the sequence, indicate only as much of the sequence as is necessary for a secure entry. Normally, it is best to place the cue stave directly above the performer’s line.”¹⁴⁷

In case of recording the flute to create a tape, there are three different types of notation for flute and flute tape. The first one is to record each flute part separately creating many melodic lines from one flute (Figure 53). Of course, a composer can add a spatial effect to this flute ensemble. The second one is to record the flute normally and then recording with changed speeds (Figure 54). Again, a composer can modify a recorded flute to such an extent that it may defy recognition. It is of highly importance to change slowly the part of the recorded flute from recognizability to unrecognizability, so that the audience can listen to the evolution of sounds. It is also possible to create impressive results when an acoustic flute track is modulated and interacted with tuba or piccolo music and/or playback. The third way is to notate only the entrances of the tape part (Figure 55). Of course, through extensive manipulation of the recorded flute, the composer creates a tape that sounds electronic. Composer creates tape with electronic sounds by manipulating the recorded flute extensively.¹⁴⁸

Although the music is experimental, the performer will eventually use a traditional notated score despite the advanced technology used. The same score will be used in rehearsals and performances. Nonetheless, this is an important exercise in creative craft. The duration of a work depends on the speed and length of the tape recording, since it's based on feedback loops. This particular parameter is neither flexible nor interpretable by the performer in this particular case.¹⁴⁹

¹⁴⁶ Gould, p. 560.

¹⁴⁷ Ibid.

¹⁴⁸ Cope, p. 184-5.

¹⁴⁹ Faia, p. 51.

Figure 53: Creating many melodic lines from one flute.

senza tempo

Flute Tape *pp* 15"

Flute Tape *pp*

Flute Tape *pp*

Flute *f* *ff* *p*

Figure 54: Recording with changed speeds.

Flute *p* *cresc.* *f*

Flute Tape start tape

Figure 55: Notate only the entrances of the tape part.

Flute

Flute Tape start tape 8va 2x

Flute Tape start tape x1/2

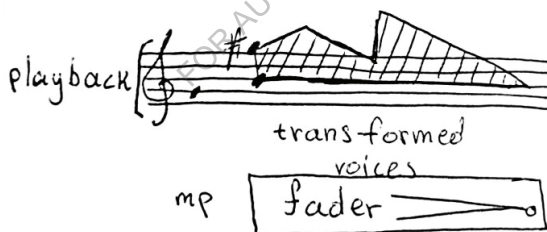
Figure 56: Framed cue for clarity purposes.



Figure 57: Stemless notes with lines.



Figure 58: Different timbres/textures with dynamic indication.



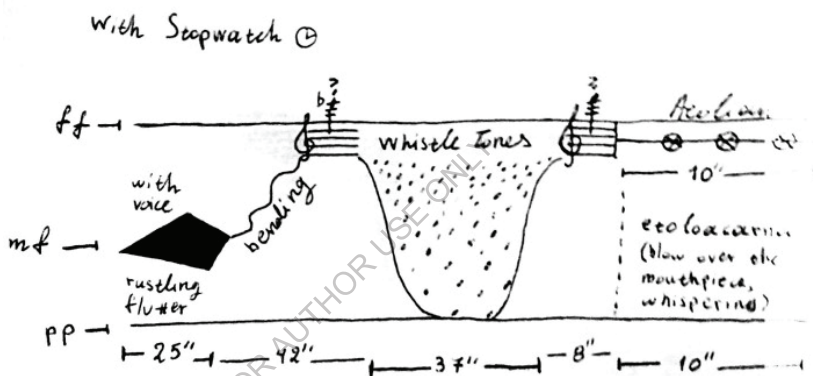
Usually, performance notes describe non-standard musical notation or extended instrumental techniques in contemporary sheet music. As a collaborative partner, the musician plays the traditional role of choosing, interpreting, and constructing the final playable version. Practical notation should not downplay the importance of giving the musician this responsibility.¹⁵⁰

¹⁵⁰ Ibid., p. 51-52.

However, detailed information about the processing used is the most important aspect of any translation or porting.

In order to interact with the audio source, there are several spatial movements designed with precise rhythmic characters, such as short complexes, ritardando/accelerando, obtrusive characters, and slow/fast moving contrasts.¹⁵¹ It is of highly importance to provide as much information as possible about the technology and the process used to perform or transmitting a work. Of course, the descriptions are good, but there is no need to depend on words alone to explain the notation. It is best to include documentation on the electronics' technology, equipment, and processing in the score.¹⁵²

Figure 59: Pattern density and different textures.



¹⁵¹ Ibid., p. 58.

¹⁵² Ibid., p. 64.

AFTERWORD

In all ages, composers and performers need to gain some knowledge regarding the principles of notation. I believe that there is no age limit on the knowledge that composers need to gain regarding different types of notation. An understanding of notation can save both composers and performers a great deal of time. Besides developing a good and healthy relationship with the composer, musicians are also interested in investing time and energy in new music. It is not professional for musicians to spend rehearsal time with reading difficulties. They eventually stumble as a result. For musicians to devote their time and minds to the performance, composers should be careful with the notation in order to avoid having to decipher the score or part. This letter from Mahler to his wife, Alma, is an example which highlights the importance of good layout when it comes to proper notation: "Whenever an instrument has a longer passage of rests, instead of writing them out in full, it has been merely written *tacet* (which is normally done only when an instrument is silent for a whole movement). So, now, not only are the players unable to find their bearings, but when I, poor devil, want to change the orchestration, instead of simply writing in the necessary bars at the appropriate place, I also have to write out the entire *tacet* passage, and sometimes have to delete several lines to make room for it. This is wasting hours and hours of my time..."¹⁵³

For pedagogical reasons, notation, and of course scoring are all necessary to transmit our music. It is difficult to set an accurate value on the sound we hear from a full score. Education and experience are the keys to understanding the sound we hear.

The fact that it is practically impossible to imagine a world without the flute, is perhaps the best proof of how important this instrument is to the musical world. There is little doubt that this instrument will extend the sonic revolution of the past and present to future levels of musical expression. Simply put, there is no need to create new notation for the same playing techniques, unless the flutist requires different notation. A composer needs to inform the performer of the purpose of a new work, because musicians play better when they understand the meaning and purpose of a new composition. However, performers also need to tell composers what they think and especially, when it comes to notation, how to better symbolize the playing techniques. The best way, is the efficient communication between flutist and composer, so that it can be determined which way of notation suits the flutist best, according to each musician regarding the use of symbols or text descriptions.

As for textual descriptions, documentation or archiving is another important aspect of the creative process, not only for a better understanding of the work, but also for the professional image and quality we give to our music. As composers, we need to keep in mind that archiving should also be part of the score, especially in the context

¹⁵³ Gould, p. xii.

of notating electronics.

The score is not the music. The score merely contains a set of instructions to the musicians, who ultimately interpret and create the music we compose. As composers, we need to respect the performer by making the score as good as possible in order to communicate successfully with the musicians and, of course, not only to facilitate sight-reading, but also to create a pleasant rehearsal atmosphere.

“The development of each and every art is determined by diverging forces and the dialectic of advance and retreat has a part to play, while the idea of the musical avant-garde is closely bound up with the term progress”.¹⁵⁴ My thesis incorporates definitions, specific instructions and examples of notation in order to help composers first understand and later use on paper and explain to the flutist each sound. Many composers were utterly convinced that experience was indispensable prerequisite of creativity, as beauty and truth are the two primary concepts of artistic theory. Beauty is the main subject in aesthetics, while truth is one of the primary issues in the philosophy of art.¹⁵⁵

I agree with Faia who says that “as musicians we are trained to understand the musical context and develop our internal ear to endlessly practice eye/ear/finger or voice dexterity, to see invisible connections within a score, to hear timbre when we see a black dot on a staff. When a composer short circuits this process, performing practice needs to be recalibrated and rethought.”¹⁵⁶

¹⁵⁴ Constantin Floros, *New Ears for New Music*, Kenneth Chalmers (trans.), Germany: Peter Lang, 2006, p. 4.

¹⁵⁵ *Ibid.*, p. 17.

¹⁵⁶ Faia, p. 63.

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